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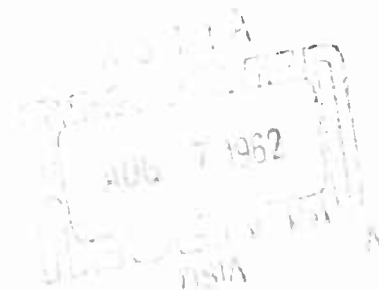
*hallicrafters*

AD NO.

MONTHLY PROGRESS REPORT NO. 1

JAMMER EVALUATOR

QRC-184(T)



MONTHLY PROGRESS REPORT NO. 1

ON

JAMMER EVALUATOR

QRC-184(T)

CONTRACT NO. AF 33(657)-9312

Period Covering  
25 June 1962 to 1 August 1962

The Hallicrafters Co.  
5th and Kostner Avenues  
Chicago 24, Illinois

Date: 10 Aug 1962  
HLC NO.: 094-903294  
Copy NO.: 34  
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MONTHLY PROGRESS REPORT NO. 1

ON

JAMMER EVALUATOR QRC-184(T)

CONTRACT NO. AF33(657)-9312

TASK NO. 6799-560A-4700

I. GENERAL REQUIREMENTS

Contract NO. AF33(657)-9312, initiated 12 June 1962, requires The Hallcrafters Company to furnish and deliver one (1) QRC-184(T) Jammer Evaluator as outlined in Section II of this report. A fully executed copy of the contract was received by the Contractor on 25 June 1962.

II. DETAILED REQUIREMENTS

The detailed requirements of Contract AF33(657)-9312 as outlined in paragraphs A to D in accordance with Exhibit "A" of the letter contract are as follows:

A. Items to Be Furnished

(a) The Contractor shall furnish the items listed below:

- (1) One QRC-184(T) Jammer Evaluator meeting the technical requirements as outlined in paragraph D of this section.
- (2) One (1) S-Band RF plug-in unit designed, tested, and manufactured in accordance with Exhibit "A".
- (3) One (1) P-Band RF plug-in unit designed, tested, and manufactured in accordance with Exhibit "A".
- (4) One (1) Control Unit designed, tested and manufactured in accordance with Exhibit "A".
- (5) One (1) Type 535 Tektronix Oscilloscope with type B plug-in pre-amplifier or equivalent.
- (6) Two (2) Operation and Maintenance Instruction Manuals including parts list.
- (7) Monthly Progress Reports, distributed in accordance with the standard QRC list.

- (8) Final Engineering Reports distributed in accordance with the standard QRC list.
- (9) Two man-months of domestic engineering services to be furnished in support of ASD evaluations
- (b) Preserving, packaging, packing, and marking the supplies called for above shall be in accordance with Contractor's Standard Commercial Practice.

#### NOTE

The rights obtained by the Government in the Subject Data are set forth in the Data Clause incorporated in the contract and nothing elsewhere in the contract or in any documents incorporated by reference in the Contract shall be construed as in any way altering such rights.

- (c) Contractor agrees to mark the number of the Contract on all Data delivered hereunder.
- (d) Reproduction of reports shall be by a method that is not printing as defined in the printing and binding regulations published by the Congressional Joint Committee on Printing.
- (e) Any reports submitted in compliance with the contract for the use of any activity of the Government shall bear the Contract number and task number. In the event any reports are required to be furnished to the Government under the contract the contractor shall mail a copy of the forwarding document (letter of transmittal) to the office having administration responsibility for the contract.

#### B. Delivery

- a. The Contractor shall deliver the supplies and perform the services called for hereunder in accordance with the following schedule.
  - Items 2, 3, 4, 5, 6, and 7 - Within seven months after receipt by the Contractor of a fully executed copy of the contract.
  - Item 9 During the course of the Contract beginning 30 days following receipt by the contractor of a fully executed copy of the contract.
  - Item 10 Upon request by the ASD Project Engineer but subsequent to delivery of Items 2, 3, 4, and 7.

- b. Request for consignment instructions for the supplies called for herein shall be made to:

AFSC Aeronautical Systems Division  
ATTN: ASNPVD-1  
Wright-Patterson  
Air Force Base, Ohio.

C. Inspection and Acceptance

Preliminary inspection of the supplies called for under Items 2, 3, 4, 5, and 7 shall be conducted by the ASD Project Engineer at the Hallicrafters Plant in Chicago, Illinois.

Final inspection and acceptance of Items 2, 3, 4, 5, and 7 shall be at the place of destination, Wright-Patterson Air Force Base, Ohio (ASNPVD-1). Supplies called for under Items 6, 9, 10, and 11 shall be inspected and accepted by the Government at the place of destination.

D. Technical Requirements

1. This section outlines the requirements of the QRC-184(T) Jamming Evaluator which will consist of two (2) different RF plug-in heads and a control unit. Either RF plug-in unit, when mechanically joined with the control unit, will form a single unit which is similar in dimensions to the AN/ALT-13(V) transmitter. RF plug-in units will contain all the components circuitry necessary to produce the necessary displays on an auxiliary oscilloscope. The control unit will provide the flexibility to accept different RF heads. This configuration will allow the frequency range of the QRC-184(T) to be extended with a minimum of expense. An oscilloscope will also be provided for display purposes. The technique incorporated in the QRC-184(T) shall be, essentially, electronically scanning or switching the various filter networks at a given commutation rate so that output signals from these filters may be appropriately processed and made available as input signals to an oscilloscope for display purposes.
2. Technical requirements of the S-Band unit when used in conjunction with the control unit.
  - a. Frequency Coverage:  
2400 MCS to 3650 MCS using 125 channels each 10 MCS wide.

b. Display:

The QRC-184(T) shall produce a panoramic type display on an auxiliary oscilloscope which indicates the distribution of RF power as a function of RF frequency.

c. RF Power Measurement:

The QRC-184(T) shall measure the RF power density of the signal under test within an accuracy of plus or minus 15 percent.

d. RF Frequency Measurement:

Two variable frequency markers shall be provided which indicate the center frequencies of the various 10 MCS channels to an accuracy of plus or minus 2 MCS.

e. Sensitivity:

A signal with an average power density of 0.5 watt and 1 MCS shall produce a full-scale deflection of the oscilloscope trace.

f. Dynamic Range:

The dynamic range shall be 20 DB.

g. Resolution:

The Resolution shall be 10 MCS.

h. Commutation Rate:

All channels shall be sampled thirty times per second.

i. Trigger and Unblanking Output:

Positive trigger pulses shall be provided to synchronize the oscilloscope sweep. Unblanking pulses shall be provided to intensity-modulate the oscilloscope trace to produce a dot pattern (power versus frequency) and frequency markers.

j. Power Requirements:

The input power to QRC-184(T) shall be  $115 \pm 10$  VAC  $60 \pm 3$  CPS single-phase, approximately 2 amperes.



k. Size:

No "Mil-specs" shall apply to the over-all dimensions. However, it shall be possible to physically place the QRC-184(T) in an AN/ALT-13 type mounting base (for aircraft installation purposes).

l. Weight:

The design objective shall be 100 pounds maximum.

m. Temperature:

The performance cited herein shall be met when the equipment is operated within an ambient temperature range 30°F to 100°F.

n. Test Equipment:

The oscilloscope to be used for display purposes will be a Tektronix type 535 with type B plug-in pre-amplifier or equivalent.

3. Technical requirements of the P-Band unit when used in conjunction with the control unit.

a. Frequency Coverage:

480 MCS to 1020 MCS using 108 channels each 5 MCS wide.

b. Display:

Same as S-Band.

c. RF Power Measurement:

Same as S-Band.

d. RF Frequency Measurement:

Two (2) variable frequency markers shall be provided which indicate the center frequencies of the various 5 MCS channels to an accuracy of plus or minus 2 MCS.

e. Sensitivity:

A signal with an average power density of 1.0 watt/MCS shall produce a full-scale deflection on the oscilloscope trace.

- f. Dynamic Range:  
Same as S-Band.
- g. Resolution:  
The resolution shall be 5 MCS.
- h. Commutation Rate:  
Same as S-Band.
- i. Trigger and Unblanking:  
Same as S-Band.
- j. Power Requirements:  
Same as S-Band.
- k. Size:  
Same requirements as S-Band but not necessarily the same dimensions as the S-Band Unit.
- l. Weight:  
The design objective shall be 120 pounds maximum.
- m. Temperature:  
Same as S-Band.
- n. Test Equipment:  
The same (one) oscilloscope cited in paragraph 2.n. shall be used for display purposes.

4. Auxiliary Equipment:

The following auxiliary equipment is required but is not considered an integral part of the QRC-184(T). Likewise, this equipment need not be packaged in the QRC-184(T) form factor.

- a. RF Load:  
500-watt capability, 2400 MCS to 3650 MCS minimum frequency range, female LT-Type connector.

b. RF Load:

500-watt capability, 480 MCS to 1020 MCS minimum frequency range, female LT-Type connector.

c. Cables:

Four each coaxial cables, type RG-117b or equivalent, with male LT-Type fittings on both ends. Length - approximately 3 feet.

d. Cables:

Six each coaxial cables, type RG-58C/U or equivalent, with type UG-88G/U fittings on one end. Length - approximately 3 feet. The other ends shall be terminated in a suitable manner for making connection to the particular type of oscillator being employed.

### III. CURRENT PROGRESS

During this first reporting period the project has been staffed with technical personnel qualified to carry out the various phases of development and the necessary test equipment obtained. A program plan has been formulated and first priority assigned to the development of the RF filters for the P-Band head. Data is being gathered concerning the electrical performance of various types of RF filters in order to determine which type is most suitable for use in the P-Band head.

An investigation has been started which will lead to the selection of the optimum detector type to be used in conjunction with the RF filters. Considerable study has been devoted to the technique to be employed in commutating and displaying the RF filter output information, the objective being to select a technique which satisfies the present equipment requirements and provides good growth potential as well.

### IV. PROGRAM FOR THE NEXT INTERVAL

During the next interval it is expected that the decision as to the type of RF filter to be employed will be made and to initiate its development. It is also expected that the commutating and display technique will be decided upon and development of the Control Unit initiated.

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